~~Claims:~~

1. A particulate water-absorbing agent comprising water-absorbing resin particles as a main component which are obtained by polymerization of an unsaturated monomer containing an acid group and/or a salt thereof and which are at least ones of nearly spherical shapes, aggregates thereof and aggregates derived from nearly spherical shapes, and said water-absorbing agent satisfies the following (a), (b), (c) and (d);

(a) centrifuge retention capacity (CRC) in a physiological saline solution being not lower than 32 g/g;

(b) mass median particle size (D50) being not smaller than 200 μm and not larger than 400 μm;

(c) ratio of particles having diameter of smaller than 150 μm being not lower than 0 % by weight and not higher than 5% by weight; and

(d) content of volatile organic compounds as atmospheric concentration measured by a gas detector tube being not lower than 0 ppm and not higher than 100 ppm.

2. A particulate water-absorbing agent comprising a water-absorbing resin particles as a main component which are obtained by polymerization of an unsaturated monomer containing an acid group and/or a salt thereof and which are at least ones of nearly spherical shapes, aggregates thereof and aggregates ~~derived from nearly spherical shapes, and said water-absorbing~~

~~agent satisfies the following (a), (b), (c) and (e);~~

(a) centrifuge retention capacity (CRC) in a physiological saline solution being not lower than 32 g/g.

(b) mass median particle size (D50) being not smaller than 200 μm and not larger than 400 μm

(c) ratio of particles having diameter of smaller than 150 μm being not lower than 0 % by weight and not higher than 5% by weight

(e) content of residual monomer after heating at 180°C for 3 hours being not lower than 0 ppm and not higher than 500 ppm.

3. A particulate water-absorbing agent comprising water-absorbing resin particles as a main component which are obtained by reversed phase suspension polymerization of an unsaturated monomer containing an acid group and/or a salt thereof, and said water-absorbing agent satisfies the following (a), (b), (c) and (d);

(a) centrifuge retention capacity (CRC) in a physiological saline solution being not lower than 32 g/g;

(b) mass median particle size (D50) being not smaller than 200 μm and not larger than 400 μm;

(c) ratio of particles having diameter of smaller than 150 μm being not lower than 0 % by weight and not higher than 5% by weight; and

~~(d) content of volatile organic compounds as atmospheric~~

~~concentration measured by a gas detector tube being not lower~~ than 0 ppm and not higher than 100 ppm.

4. A particulate water-absorbing agent comprising water-absorbing resin particles as a main component which are obtained by reversed phase suspension polymerization of an unsaturated monomer containing an acid group and/or a salt thereof, and said water-absorbing agent satisfies the following (a), (b), (c) and (e):

(a) centrifuge retention capacity (CRC) in a physiological saline solution being not lower than 32 g/g

(b) mass median particle size (D50) being not smaller than 200 μm and not larger than 400 μm

(c) ratio of particles having diameter of smaller than 150 μm being not lower than 0 % by weight and not higher than 5% by weight

(e) content of residual monomer after heating at 180°C for 3 hours being not lower than 0 ppm and not higher than 500 ppm.

5. A particulate water-absorbing agent according to any one of claims 1 to 4 wherein at least a part the agent comprises agglomerated particles.

6. A particulate water-absorbing agent according to any one of claims 1 to 5 which is obtained by further comprising water insoluble inorganic fine particles.

~~7. A particulate water-absorbing agent according to~~

~~any one of claims 1 to 6 which is obtained by further comprising~~ a reducing agent.

8. A particulate water-absorbing agent according to any one of claims 1 to 7 wherein the water-absorbing agent further satisfies the following (f):

(f) absorbency against pressure at 1.9 kPa in a physiological saline solution being not lower than 20 g/g.

9. A method for production of the particulate water-absorbing agent according to any one of claims 1 to 8, which comprises:

a step of providing acrylic acid having a content of acetic acid and propionic acid of not higher than 500 ppm, and a content of acrylic acid dimer of not higher than 1000 ppm;

a reaction step of reversed phase suspension polymerization of an unsaturated monomer containing the acrylic acid and/or a salt thereof as a main component of the monomer in a hydrophobic organic solvent;

a step of adding an aqueous solution of a surface crosslinking agent without including any organic solvent to cross-linked polymer particles which are obtained by the polymerization and which satisfy the following (a), (b) and (c):

(a) centrifuge retention capacity (CRC) in a physiological saline solution being not lower than 32 g/g;

~~(b) mass median particle size (D50) being not smaller~~

~~than 200 μm and not larger than 400 μm; and~~

(c) ratio of particles having diameter of smaller than 150 μm being not lower than 0 % by weight and not higher than 5% by weight; and

a step of surface crosslinking by heating at a temperature of not lower than 150°C and not higher than 250°C.

10. A method for production according to claim 9 which further comprises a step of agglomeration.

11. A method for production according to claim 10 wherein the agglomeration is carried out in the reaction step of reversed phase suspension polymerization.

12. A method for production according to claim 10 which further comprises a step of agglomeration comprising: adding water, heating in the state of keeping the water content of not lower than 1 % by weight and not higher than 10% by weight and crushing of thus resulting aggregates.

13. An absorbing article for excrement, urine or blood, which is molded by comprising a particulate water-absorbing agent according to any one of claims 1 to 8 and hydrophilic fibers.

14. An absorbing article according to claim 13 wherein content of the particulate water-absorbing agent based on total weight of the particulate water-absorbing agent and the hydrophilic fibers is not lower than 30% by weight and not grater ~~than 100% by weight.~~

Claims:

[Claim 1]

A particulate water-absorbing agent comprising water-absorbing resin particles of not lower than 70% by weight, the water-absorbing resin particles being obtained by conducting reversed phase suspension polymerization of acrylic acid and/or a salt thereof, mixing a surface crosslinking agent, and conducting a heat treatment, wherein

in the reversed phase suspension polymerization, an aliphatic hydrocarbon selected from n-heptane and cyclohexane is used as an organic solvent,

a temperature of the water-absorbing resin in the heat treatment is not lower than 100°C and not higher than 280°C,

the water-absorbing agent satisfies the following (a) to (d):

(a) centrifuge retention capacity (CRC) in a physiological saline solution being not lower than 32 g/g and not higher than 60 g/g;

(b) mass median particle size (D50) being not smaller than 200 μm and not larger than 400 μm;

(c) ratio of particles having diameter of smaller than 150 μm being not lower than 0 % by weight and not higher than 5% by weight; and

(d) content of the organic solvent as atmospheric concentration measured by a gas detector tube after the particulate water-absorbing agent of 6.00 g is permitted to swell by 30 ml of a 0.90% by weight aqueous solution of sodium chloride being not lower than 0 ppm and not higher than 100 ppm, and

total content of acetic acid and propionic acid

in the acrylic acid is not higher than 500 ppm.

[Claim 2]

A particulate water-absorbing agent according to claim 1 wherein acrylic acid dimer content in the acrylic acid is not higher than 1000 ppm.

[Claim 3]

A particulate water-absorbing agent according to claim 1 or 2, further comprising an aminopolyvalent carboxylic acid having 3 to 20 carboxyl groups and a salt thereof.

[Claim 4]

A particulate water-absorbing agent according to claim 3 wherein the aminopolyvalent carboxylic acid and the salt thereof are at least one member selected from diethylenetriamine pentaacetic acid, triethylenetetramine hexaacetic acid, cyclohexane-1,2-diamine tetraacetic acid, N-hydroxyethyl ethylenediamine triacetic acid, ethylene glycol diethyl ether diamine tetraacetic acid, ethylenediamine tetrapropionic acetic acid, N-alkyl-N'-carboxymethyl aspartic acid, N-alkenyl-N'-carboxymethyl aspartic acid, alkaline metal salts thereof, alkaline earth metal salts thereof, ammonium salts thereof, or amine salts thereof.

[Claim 5]

A particulate water-absorbing agent according to claim 3 or 4 wherein using amount of the aminopolyvalent carboxylic acid and the salt thereof is 0.0001 to 1 part by weight based on 100 parts by weight of the water-absorbing resin.

[Claim 6]

A particulate water-absorbing agent according to any one of claims 1 to 5 wherein the water-absorbing agent further satisfies the following (e):

(e) content of residual monomer after heating at 180°C for 3 hours being not lower than 0 ppm and not higher than 500 ppm.

[Claim 7]

A particulate water-absorbing agent according to any one of claims 1 to 6 wherein the water-absorbing agent further satisfies the following (f):

(f) increased extractable component by deterioration (a value specified by (extractable component content for one hour after deterioration Ex1) - (extractable component content for one hour Ex2) in mimicked artificial urine for deterioration test of 0.05% by weight of L-ascorbic acid) being 0 to 15% by weight.

[Claim 8]

An absorbing article for excrement, urine or blood, which is molded by comprising a particulate water-absorbing agent and hydrophilic fibers, wherein

the particulate water-absorbing agent contains, as a main component, water-absorbing resin particles obtained by conducting reversed phase suspension polymerization of acrylic acid and/or a salt thereof, mixing a surface crosslinking agent, and conducting a heat treatment

in the reversed phase suspension polymerization, an aliphatic hydrocarbon selected from n-heptane and cyclohexane is used as an organic solvent,

the water-absorbing agent further satisfies:

(a) centrifuge retention capacity (CRC) in a physiological saline solution being not lower than 32 g/g and not higher than 60 g/g;

(b) mass median particle size (D50) being not smaller than 200 μm and not larger than 400 μm;

(c) ratio of particles having diameter of smaller than 150 μm being not lower than 0 % by weight and not higher than 5% by weight; and

(d) content of the organic solvent as atmospheric concentration measured by a gas detector tube after the particulate water-absorbing agent of 6.00 g is permitted to swell by 30 ml of a 0.90% by weight aqueous solution of sodium chloride being not lower than 0 ppm and not higher than 100 ppm, and

total content of acetic acid and propionic acid in the acrylic acid is not higher than 500 ppm.